American
GAS JOURNAL
EST. 18
ATURDAY, JANUARY

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The Eastern Service Co.
Boston

Pacific Coast Representatives:
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San Francisco

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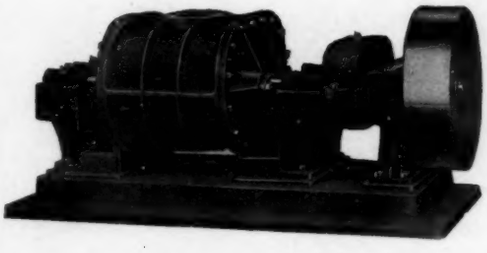
Company	*Location.*	*Capacity*
Pacific Gas & Electric Company	Oakland, Calif.	30,000,000
" " " "	San Francisco, Calif.	30,000,000
" " " "	San Jose, Calif.	5,000,000
" " " "	Fresno, Calif.	5,000,000
" " " "	Sacramento, Calif.	5,000,000
Seaboard By-Product Coke Company	Jersey City, N. J.	24,000,000
Pittsburgh Crucible Steel Company	Pittsburgh, Pa.	12,000,000
Denver Gas & Electric Company	Denver, Colo.	12,000,000
U. G. I. Contracting Company for the Allentown-Bethlehem Gas Company	Bethlehem, Pa.	10,000,000
Rochester Gas & Electric Corporation	Rochester, N. Y.	6,000,000
Indiana Coke & Gas Corporation	Terre Haute, Ind.	3,000,000
Wisconsin Gas & Electric Company	Racine, Wis.	3,000,000
Meriden Gas Light Company	Meriden, Conn.	2,000,000
Battle Creek Gas Company	Battle Creek, Mich.	2,000,000
Woodall-Duckham-Jones, Ltd.	London, England	600,000

The KOPPERS COMPANY

Designers and Builders of
By-Product Coke & Gas Ovens

PITTSBURGH, PA.

Victor Gas Pumps



Described in Bulletin 13-B.

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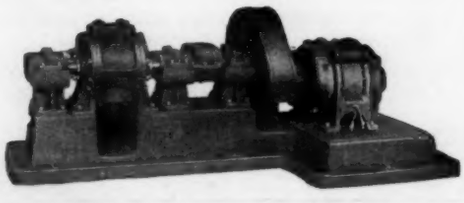
Connersville Valveless Rotary Pumps



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Flow of Gases Through Orifces

What Has Been Developed by Some Experimental Work

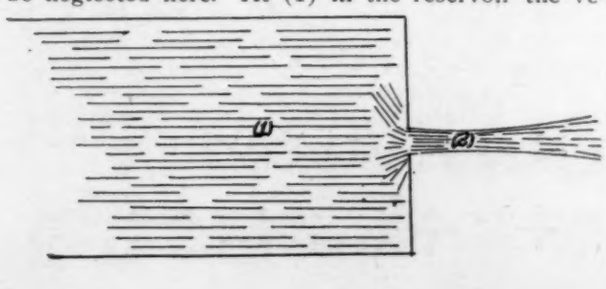
By GEORGE B. SHAWN

There has been some disagreement among men conducting investigations with gases regarding the exact nature of the efflux of gases through orifices. The formula generally used by people of the gas industry is the simple hydraulic formula for flow of fluids; while those engaged in more accurate work insist that the flow is essentially adiabatic, with some small correction to be made for the viscosity of the gas, heat conduction, etc. In this paper an attempt is made to compare the hydraulic formula for the velocity of efflux with that obtained by considering the flow as purely adiabatic. The effect of viscosity and heat conduction from the orifice is not discussed here, as the effect of these factors is negligible, except for very small orifices. Moreover, no data of this nature have been taken except in comparisons of various gases; an expression for the absolute value of the effects of these factors is, therefore, impossible without a great amount of careful experimental work.

When a fluid flows under pressure through an orifice the jet formed by the fluid after efflux will vary in size according to the shape of the wall in which the smallest orifice is made. For ordinary ranges of pressure, however, the diameter of the jet at its smallest section remains constant. It is then evident that the quantity of gas flowing through the orifice in a given time is proportional to the velocity of efflux. Therefore, in order to compare the flow of gases, making the assumptions mentioned above, an expression for the velocity of efflux in each case will be sufficient.

A. The Hydraulic Formula

The velocity of efflux is determined by application of Bernoulli's Theorem, which states that the total "heads" at any two points in the gas stream must be equal, neglecting friction. In the case of a gas the friction loss is exceedingly small and will be neglected here. At (1) in the reservoir the velocity is relatively small and the "head" consists of the pressure head p_0; while the "head" at (2) in the jet is the velocity head $V^2/2g$ plus barometric pressure where (V) is the velocity of the gas stream. Equating these values



$$p + V^2/2g = p_0 \text{ and } V = \sqrt{2g \cdot (p_0 - p)}$$

In order to obtain a linear value of (V) it is necessary to express the head in terms of the height of a column of the fluid. Then, if (d) is the density of the gas, this height will be p_0/d, if (p_0) is expressed in the usual pressure terms. The velocity formula then reads

$$V = \sqrt{2g \cdot p_0 - p/d}$$

From this formula the velocity may be determined only in terms of the gravitational system of units, and (g) and (p_0) must be expressed in terms of that same system.

It should be noted that in this formula no change of volume caused by pressure or temperature changes in the gas after efflux is considered.

B. The Adiabatic Formula

In the following discussion the gas will be considered ideal, as all gases follow ideal conditions very closely under the pressures used in gas work. These pressures seldom exceed one-third of an atmosphere. The symbols used, and their meanings, are as follows:

p_0 = pressure before efflux
p = pressure after efflux
T_0 = absolute temperature before efflux.
T = absolute temperature after efflux
Cp = specific heat—constant pressure
Cv = specific heat—constant volume
k = ratio of specific heats
E = internal or heat energy of gas
R = gas constant
K = kinetic energy of motion of gas
V = velocity of gas in jet
S = entropy
Q = quantity of heat

Writing the energy equation for a section before efflux, and a section of the jet, we obtain by the first law of thermodynamics

$$(K + E) + pv - Q = (K_0 + E_0) + p_0v_0 \quad (1)$$

Since the velocity before efflux is relatively small (K_0) may be put equal to zero and equation (1) becomes

$$(K + E) + pv - Q = E_0 + p_0v_0$$

or $K = (E_o + p_o v_o) - (E + pv) + Q$ (2)

If the gas is ideal, the following conditions obtain

$$pv = RT, \quad C_v = \text{constant}$$

$$E = TC_v + \text{constant}, \quad C_v + R = C_p$$

Using these conditions to eliminate (E), (E_o), $(p_o v_o)$, and (pv) from equation (2)

$$K = (T_o C_v + RT) - (TC_v + RT) + Q$$

$$= (T_o - T)(C_v + R) + Q$$

$$K = (T_o - T) C_p + Q \quad (3)$$

In the jet

$$K = \frac{1}{2} v^2 \quad (4)$$

Then $$\frac{1}{2} v^2 = (T_o - T) C_p + Q \quad (5)$$

When the efflux is adiabatic Q = 0 and

$$\frac{1}{2} v^2 = (T_o - T) C_p \quad (6)$$

In order to make use of equation (6) we must obtain an expression under adiabatic conditions of expansion for the temperature. From the relations of energy, heat, work, and entropy,

$$dE = dQ - pdv \quad (7)$$

$$dQ = TdS \quad (8)$$

we obtain $$dE = Tds - pdv \quad (9)$$

Putting $E = C_v T$ and $pv = RT$

$$\frac{dE}{E} = \frac{TdS}{C_v T} - \frac{pdv}{C_v T} = \frac{1}{C_v} dS - \frac{R}{C_v} \frac{dv}{v} \quad (10)$$

Integrating

$$\log E = \frac{S}{C_v} - \frac{R}{C_v} \log v \quad (11)$$

From the expression

$$E = C_v T \text{ and equation (11)}$$

$$\log E = \log C_v T = \log C_v + \log T$$

$$\log E = \frac{S}{C_v} - \frac{R}{C_v} \log v$$

$$\log C_v + \log T = \frac{S}{C_v} - \frac{R}{C_v} \log v$$

$$\frac{S}{C_v} = \log C_v + \log T + \frac{R}{C_v} \log v$$

$$S = C_v \log C_v + C_v \log T + R \log v \quad (12)$$

is the efflux is adiabatic S remains constant; while $C_v \log C_v$ is also constant so that

$$C_v \log T + R \log v = \text{constant} \quad (13)$$

Substituting $\frac{pv}{R}$ for T

$$C_v \log \frac{pv}{R} + R \log v = \text{const.}$$

$$\log \left(\frac{pv}{R}\right)^{C_v} v^R = \text{const.}$$

$$\frac{1}{(R)^{C_v}} \log (pv)^{C_v} v^R = \text{const.}$$

$$\text{and } (p)^{C_v} (v)^{C_v + R} = \text{const.} \quad (14)$$

Placing $\frac{RT}{p} = v$ and $R = C_p - C_v$ in (14) we have

$$(p)^{C_v} \times \left(\frac{RT}{p}\right)^{C_p - C_v + C_v} = \text{const.}$$

$$(p)^{C_v} \times \frac{(T)^{C_p}}{(p)^{C_p}} \times (R)^{C_p} = \text{const.}$$

$$(p)^{C_v - C_p} \times (T)^{C_p} = \frac{\text{const.}}{R^{C_p}} = \text{const.}$$

$$(T)^{C_p} = \text{const.} \times (p)^{C_p - C_v}$$

$$T = \text{const.} \times (p)^{\frac{C_p - C_v}{C_p}}$$

Dividing and multiplying exponent of p by C_v

$$T = \text{const.} \times (p)^{\frac{\frac{C_p - C_v}{C_v}}{\frac{C_p}{C_v}}}$$

(Note) This expression is exponent of P

$$T = \text{const.} \times (p)^{\frac{k-1}{k}} \quad (15)$$

From equation (15) and putting $\frac{k-1}{k} = a$ for convenience

$$\frac{T_o}{T} = \frac{\text{const.} \times p_o^a}{\text{const.} \times p^a}$$

$$T = T_o \left(\frac{p}{p_o}\right)^a \quad (16)$$

By substituting this value of T in equation (6) we find that

$$\frac{1}{2} v^2 = (T_o - T) C_p = T_o C_p \left[1 - \left(\frac{p}{p_o}\right)^a\right]$$

Since $RT_o = p_o v_o$, $T_o = \frac{p_o v_o}{R}$

and $$\frac{1}{2} v^2 = \frac{C_p}{R} (p_o v_o) \left[1 - \left(\frac{p}{p_o}\right)^a\right]$$

But $$\frac{C_p}{R} = \frac{C_p}{C_p - C_v} = \frac{k}{k-1} = \frac{1}{a}$$

$$\text{Then } \frac{1}{2}v^2 = \frac{p_0 v_0}{a}\left[1 - \left(\frac{p}{p_0}\right)^a\right]$$

$$v = \frac{2p_0 v_0}{a}\left[1 - \left(\frac{p}{p_0}\right)^a\right]$$

Expressing this equation in engineering units and substituting for v_0 its equivalent in terms of the density,

$$v = \sqrt{2g \cdot \frac{p_0}{d} \cdot \frac{1 - \left(\frac{p}{p_0}\right)^a}{a}} \qquad (17)$$

C. Comparison of the Two Formulas

A comparison of the two formulas shows that the value for the velocity of efflux obtained when the flow is considered adiabatic differs from the value in the hydraulic formula by the factor $1 - \frac{(p/p_0)^a}{a}$.

It can be seen at a glance that this factor increases with the pressure of the gas before efflux. Let us find the magnitude of the factor when the gas is under pressures corresponding to those at which gas is ordinarily used, such as those in a city supply. The pressure in this case is generally about four inches of water, or one-hundredth of an atmosphere above atmosphtric pressure. Let the difference between atmospheric pressure and the gas line pressure (four inches of water in the case stated above) be P

Then $p = p_0 - P$

and $(p/p_0)^a = (p_0 - P/p_0)^a = 1 - (P/p_0)^a$

Expanding by the binominal theorem and discarding terms containing powers of P/p_0 beyond the first, since this ratio is small

$$(p/p_0)^a = 1 - a \cdot p/p_0$$

Placing this value in equation (17) given above,

$$V = \sqrt{2g\,\frac{p_0}{d} \cdot \frac{1-(1-a\,P/p_0)}{a}} = \sqrt{\frac{2gP}{d}} = \sqrt{2g\,\frac{p_0 - p}{d}}$$

This value is identical with that obtained using the hydraulic formula, the only difference in the two occurring through the omission of the higher powers of P/p_0. In the case of the city supply where P is taken as four inches of water pressure, the difference will be less than 0.1 of 1 per cent. The difference will evidently be greater when the pressure is greater. Unless great accuracy of calculation is desired, no appreciable error will be experienced in the selection of a velocity formula.

Relations of Employee and Public*

Success of Company Depends Largely on Employees' Attitude

By A. G. CURTIS, Shreveport, La.

The largest and most important retail merchant in every community is its Public Utility, dispensing gas, electricity, car fares, etc., to nearly every person, and extending credit for each and every sale. This utility, however, differs from retail merchants in other lines, such as butchers, grocers, bakers, general merchandise, clothing, shoes, etc., in that the utility does not have competition, and its business is under regulation and the rates are fixed by the Public Service Commissions, making it in effect a Public Servant.

It has been said that the attitude of the public toward its utilities can be explained by the fact that the public, its patrons, cannot indulge in the great American sport of shopping, due to the fact that there is no other company to go to. That is probably the explanation and emphasizes the sound policy of every utility to take its consumers into its confidence and not only render good service to its patrons but to do so with courtesy, attention and appreciation.

Whether under regulation or not, efficient and economical service can only be given a community by any utility without competition in its particular line, as it needs all of that business, getting the cream with the skim milk in order to function properly. Under regulation, there obviously should be no competition.

The retail merchant in other lines—that is, the successful one,—has his place of business in a convenient location, has his goods so arranged as to be easily inspected, his displays in brilliantly lighted windows, advertises in the local papers and by electric signs, sells good goods at reasonable prices, and demands of employees courteous, pleasant and honest treatment of his patrons, almost to the point of servility, and any employee not conforming to this policy soon meets the suggestion that he should find employment elsewhere better suited to his qualifications. His policy is to so deal with every patron that he will come again and continue until he is a regular monthly consumer. He usually extends monthly credit, though this custom would be short-lived if his average monthly individual account was not more than that of utilities.

The retailer knows to a certainty that any customer not satisfied in any respect will take his account to his competitor across the street, and insignificant incivilities and an independent attitude induce dissatisfaction. Is there any reason why such a policy that is successful and popular merchandising with this class of competitive business is not the wise policy for our business? Surely there is none. But it is of much greater importance that the patrons of a public utility be satisfied in every respect, for the reason that if dissatisfied, whether for a real or imaginary reason, they do not have the opportunity of taking their account across the street, and a feeling of oppression is created.

We utilities not only wish to but must sell *all* of the gas, electricity, etc., to *all* the people of a community all the time. Although utilities are non-competitive in the respect that here are no other merchants in the

*Paper read at convention of South Central Gas Association.

same line of business to compete, yet it is intensely competitive, in that the service rendered must compete with other services in quality and price.

Can Natural Gas be sold at rates that will cost more than other fuels to either domestic or industrial consumers? Can it be sold profitably with service intermittent or undependable? Can artificial gas, electric light and power or car rides? You can tell the world they cannot! You and your patrons know they cannot.

Good Service Is Good Business

Is it good business to give good service grudgingly and without a grin, instead of furnishing it willingly and with a smile? We need the good will of the public, our patrons. The first paper read at this convention told us why. It is our greatest asset. The second paper, "Relations of Employer and Employee," has told how to provide the means of securing it. These are vitally important, as is every phase of a utility operation. No one more important than the others, but all must be massed together to win the ultimate goal—a contented customer. There must be no weak positions. And here the employee comes into the game to fill his or her position.

In the mind of a consumer, who is the Gas Company or Electric Company? It is not the stockholders, nor directors, nor executives, but it is that individual employee with whom the consumer comes in direct personal contact in business with the Company in any operation of rendering the consumer service. This service does not consist of merely delivering a given commodity and end there. In serving our customers, there are dozens of points of contact requiring personal dealing between consumer and employee, with the human element ever present.

Employee Must Please Customers

The employee's duty is to facilitate business and send the customer away pleased with his treatment. Good Will for a utility is not gained by the New Business Man of the Company, who tracks mud across the freshly cleaned porch of a housewife, nor is it helped by curt, careless or impertinent telephone conversation, but only creates in the consumer's mind the impression that such things are countenanced by the management, reflecting a false attitude of a policy of "Don't Care," and that of the well known statement of the old Knickerbocker Commodore, that has caused unnecessary trouble and money losses and which Public Utilities have been trying to live down ever since.

The Trouble Shooter, who does not render willing and smiling service, only makes more trouble for the company and himself, as did one for a gas company in a Southern city, who, after adjusting a gas range, told the mistress, "This is the last time I intend to fool with this thing. You let it alone." He had not returned to the office before the husband had demanded his dismissal for insulting his wife.

You have all heard of the new Meter Reader who rang the front doorbell of the mayor's house, until he got out of bed and answered himself. "I want to read your meter." "Well, why in blazes don't you go around to the rear, where it is?" "I don't have to. I represent the Gas Company." Such occurrences do not either help the company or the employee, nor relieve the responsibilities of executives who have in these and similar happenings examples of the necessity of avoiding them by careful selection of employees to fit each particular position and the necessary instruction and schooling. But this phase does not come within the scope of this paper.

Employees Have Troubles, Too

The employees' difficulties are many, as there are some unreasonable customers, but alertness and unfailing good humor will win, as it did in the case of a consumer who refused to pay a bill that was, on account of a technicality, not a legal obligation. The employee handling complaints of this character, by patiently and thoroughly explaining the circumstances, convinced her that it was a moral obligation and the account was paid and the employee thanked for his patience. The public is reasonable and fair, but cannot be expected to see the company's side of any proposition unless carefully explained. The regulations and requirements of utilities, to many customers, at first seem too rigid, but when the employee explains the reasons for safety, protection and facilitation of business, they are promptly accepted.

We are all too prone to feel that the utility business is so very different from others that constant explanation of some of its special features is useless. It differs in little respects from the other retail businesses in the matter of difficulties, and the employee has the same incentive of advancing himself by promoting the interests of his employer.

The employee's relations with the public should extend beyond those in connection with the gas business. He should be a normal and good citizen and take his proper part in all the activities of his community. He has no right to feel that he is engaged in a nefarious business. He should take more than usual interest in politics and be active in his political convictions. He should believe in his company and have faith in its purpose of giving its community a square deal and value received, with good and dependable service at reasonable rates, but asking to be permitted such rates as will enable it to make a fair return and furnish good service. It cannot be done unless the rates permit.

Let him tell his friends and neighbors so. Tell everybody. Tell the world! Be as sincere in this as in everything else. Take pride in being an employee of such a company. No line of business has had as small returns for the money and effort expended, and there are no finer patriots than those who have invested money and kept this necessary business alive during the critical years we have passed through and are still passing.

There is no business for profit having higher aims or more devoted purposes than that having its property consecrated to the convenience, comfort, health and necessities of the public, and every employee of such a utility has this conviction to support him in his relations with the public.

Finds Indianapolis Rate Confiscatory

Federal Court Referee Believes Rate Should Be $1.25 per M.

In the most important development affecting the gas industry in Indiana in many years, the Citizens Gas Company of Indianapolis again holds the limelight. On December 28, 1922, recommendation that the gas rate for Indianapolis consumers of the company's product should be fixed at $1.25 a 1,000 cubic feet was made by William P. Kappes, special master in chancery (and recently named clerk of the Federal Court for the District of Indiana), in a report submitted to Judge Albert B. Anderson. The report declared that the rate of $1.25 is necessary to yield a fair return on the property of the Citizens Gas Company and that the rate of 90 cents ordered by the Public Service Commission of Indiana some time ago was confiscatory and in violation of the Constitution of the United States.

Mr. Kappes submitted copies of the report immediately to the attorneys of the Citizens Gas Company, plaintiff in the suit, and to counsel for the Public Service Commission, Attorney-General of Indiana U. S. Lesh, and Governor Warren T. McCray. The special master fixed Wednesday, January 3, as the date for argument on the report. In the event attorneys for the State were not able to attack the report successfully at that time, Mr. Kappes indicated that he immediately would file a final report with Judge Anderson. In the event the final report is the same as the tentative report and is approved by the court, the next possible legal step perhaps would be a petition for a rehearing and it seemed possible that an appeal might go to the Supreme Court of the United States.

A. B. Cronk, attorney representing the Public Service Commission, let it be known that the commission already has discussed the possibilities of an appeal to the higher court.

The report of the special master in chancery found that the plaintiff company "ought to have all of relief asked for in the bill of complaint."

It also recommended that all money impounded under the order of the court when the case was first heard in Federal Court by three Federal judges should be turned over to the plaintiff and no additional sums of money impounded. The money in question is the difference between the income of the company from the 90-cent gas rate allowed by the commission and the $1.20 rate allowed as an emergency measure in Federal Court in the preliminary hearing of the case.

The finding of Mr. Kappes was based primarily on the contention that the 90-cent rate enforced against the gas company by the Public Service Commission was unjust because it was confiscatory of the gas company's property without due process of law.

The conclusions of the special master follow:

(1) That the rate of 90 cents per 1,000 cubic feet, enforced against the plaintiff at the beginning of this suit was confiscatory of the property of plaintiff and was a violation of the Constitution of the United States.

(2) That a rate of $1.25 per thousand cubic feet of gas is the minimum rate that will be sufficient to yield a fair return upon the value of the plaintiff's property used and useful in the public service.

(3) That all the sums of money impounded under the order of the court should be released and returned to the plaintiff and that no additional sums of money should be impounded.

(4) That the plaintiff ought to have all the relief prayed in the bill.

The gas company attacked the finding of the Public Service Commission, which ruled against increasing the gas rate more than 90 cents a thousand cubic feet. A temporary injunction order was issued May 15, 1922, in Federal Court, by Federal Judges Francis E. Baker and Samuel Alschuler, of the Circuit Court of Appeals, and A. B. Anderson, of the Federal Court for the District of Indiana, restraining the Public Service Commission from enforcing the 90-cent gas rate. The court then authorized the gas company to collect $1.20 a thousand cubic feet for gas until the case finally was adjudicated. The gas company also was ordered to give bond of $15,000 each month in advance to insure the proportionate refunding to consumers of the moneys thus impounded.

The complaint was filed by the gas company in the Federal Court April 22, 1922, asking the court to enjoin the Public Service Commission from interfering with the gas company in charging and collecting $1.25 per 1,000 cubic feet for gas and also restraining the commission from enforcing its order fixing the gas rate at 90 cents per thousand cubic feet.

Court Not Rate-Making Body

In his report Mr. Kappes said that the court was not a rate-making body, but he said its function was to prevent the enforcement of confiscatory rates. He also declared that in finding what rate would yield a fair return on the fair value of the plaintiff's property, the court would not supersede the State's rate-making powers.

Mr. Kappes selected as a test year the period between May 1, 1921, and April 30, 1922. He found that during the test year, the net cost of producing the gas sold consumers was 83.76 cents per thousand cubic feet.

For rate-making purposes, Mr. Kappes adopted 85 per cent of the valuation of the physical property of the company, or 85 per cent, of $18,834,727, which gave $16,009,516, allowing for depreciation. Mr. Kappes fixed 7 per cent as a "fair return" on the amount of money invested in the gas company.

The appraisement by Stone & Webster, Inc., of the property of the gas company at prices prevailing July 1, 1922, Mr. Kappes accepted as a correct basis for figuring the valuation. The valuation basis was designated by Mr. Kappes to be as of July 1, 1922. He held that the price levels of 1922 should be the basis for the rate.

The valuations of the physical properties on the 85 per cent basis, adopted by Mr. Kappes, included $8,917,761 for the Citizens Gas Company; $7,047,736 for the Indianapolis Gas Company, and $44,019 for the Pintsch Gas Company, making a total of $16,009,516. The fair return, at 7 per cent per annum on this valuation would be $1,120,666.12.

Mr. Kappes reported that the test year has showed the net profits applicable to a fair return upon the property amounted only to $133,809.69, which, deducted from the total "fair return" figure of $1,120,666.12, would leave $986,856.43 as the amount which should be made up in order that the owners of the property receive a "fair return" on their investment.

"A careful scrutiny by the master of all the evidence fails to disclose that any of the expenditures of the Citizens Gas Company have been wasteful or extravagant, but on the contrary, the uncontradicted evidence is that the expenditures have been more than ordinarily prudent and economical," the report said. This statement apparently completely answered charges of extravagance and imprudent expenditures, which the Public Service Commission made in one of the earlier actions in the big rate case.

A. B. Cronk, representing the Public Service Commission, expressed surprise when he heard of the master's finding and said the rate of $1.25 was at least 15 cents too high. State officials also expressed the opinion that the selection of the test year had been unfortunate and had worked to help the company in the case.

The Citizens Gas Company was organized as the successor of the Consumers Gas Trust Company, organized in 1887 after acquiring the property of the Broad Ripple Natural Gas Company, founded in 1886. The Citizens Gas Company was the result of a popular movement opposed to the gas rates of the Indianapolis Gas Company, which was organized in 1898 and succeeded the Indianapolis Natural Gas Company, organized in 1887 after acquiring the property of the Capitol City Gas Company, founded in 1886.

Until 1913 the Indianapolis Gas Company and the Citizens Gas Company were competitors. In that year the latter company acquired the property of the former company.

In 1918 the Citizens Gas Company obtained all of the capital stock of the Milburn By-Products Coal Company, located in West Virginia, in order to insure a supply of the best coal for the making of gas.

The Public Service Commission was represented in the hearings by A. B. Cronk, assisted by Edward M. White, deputy attorney general of Indiana, and Taylor E. Groninger, corporation counsel of the City of Indianapolis. The gas company was represented by H. H. Hornbrook, assisted by Paul Haynes, former public service commissioner, and Paul Y. Davis.

The hearings in Federal Court before the master in chancery were begun in September, but continued from Sept. 27 to Oct. 16. Several experts were introduced by both sides of the case. There were repeated verbal clashes between attorneys in the hearings regarding testimony. Voluminous exhibits were introduced. The hearings were postponed from Oct. 30 until Nov. 9 and continued again in December, when each side presented briefs and oral argument.

Pertinent extracts from the report of Mr. Kappes follow:

1. The Issues—The bill of complaint filed April 22, 1922, alleges that the Citizens Gas Company was furnishing gas to the citizens of Indianapolis at a rate fixed by the Public Service Commission of Indiana of ninety cents (90c) per thousand cubic feet; that such rate was confiscatory of its property; that it had made reasonable application to the Public Service Commission of Indiana for an increase of such rate to one dollar and twenty-five cents ($1.25) per thousand cubic feet; that said commission had refused to permit any increase of rate; that unless said rate, one dollar and twenty-five cents ($1.25) per thousand cubic feet, be granted, the Citizens Gas Company will be deprived of its property without due process of law and without just compensation, in violation of the Constitution of the United States. The prayer is for an injunction restraining the defendants from enforcing the said rate of ninety cents (90c) per thousand cubic feet for gas and from interfering with plaintiff in charging and collecting one dollar and twenty-five cents ($1.25) per thousand cubic feet.

The defendants by their answer filed May 25, 1922, deny the said rate of ninety cents (90c) per thousand cubic feet for gas will operate to confiscate the property of the Citizens Gas Company or deprive it of a fair return on the fair value of its property used and useful in the manufacture and distribution of gas.

Injunction Granted

On May 15, 1922, the court granted a temporary injunction restraining the defendants from enforcing the said rate of ninety cents (90c) per thousand cubic feet of gas and from preventing the plaintiff from charging "such rate for gas as will provide a reasonable return upon the fair value of plaintiff's property used and useful in the public service not exceeding one dollar and twenty cents ($1.20) per thousand cubic feet." Provision was made for impounding the excess over and above the rate of ninety cents (90c) per thousand cubic feet pending the final disposition of the case and for the giving of bond to insure the repayment to consumers of gas "of any sums collected for gas in excess of what shall upon final hearing be determined to have been sufficient to yield a fair return upon the value of the plaintiff's property used and useful for the public."

The issues therefore which have been referred to the master for report are not only the question of whether the rate of ninety cents (90c) per thousand cubic feet of gas is confiscatory, but also the question what rate per thousand cubic feet of gas will be sufficient to yield a fair return upon the plaintiff's property.

It is well settled that the court is not a rate making body, but its function in such matters is to prevent the enforcement of confiscatory rates. By finding what rate will yield a fair return on the fair value of the plaintiff's property, however, the court will not supersede the state's rate-making powers. The plaintiff will remain subject to the jurisdiction of the State's agencies for rate-making purposes and will be bound by decisions of such agencies, providing such decisions do not operate to confiscate the plaintiff's property. These powers of the State may be exercised at any time in the future.

In other words, subject to the constitutional limitations that the State shall not confiscate property, all powers of the State to fix and control rates of public service corporations would remain unimpaired.

From the time of its organization until May 6, 1921, the Citizens Gas Company supplied gas to its consumers in Indianapolis at a rate of 60 cents per 1,000 cubic feet. This was made possible by the adoption of what is known as the "coke by-product process" of making gas, whereby the profits realized from the sale of coke and other by-products serve to decrease the net cost of producing gas. This process could not be relied upon exclusively, but it could be relied upon economically only so far as it was possible to market the coke and other by-products at profitable prices. The coke by-product process has at no time been available for the production of the entire supply of gas needed by the citizens of Indianapolis, and the only other process to which resort could be had was the older and more expensive water gas process.

War Profits Helped Consumers

In the year 1915 the Citizens Gas Company, mainly through the initiative and efforts of its manager, J. D. Forest, succeeded in procuring a contract whereby a foreign company agreed to and did, at its own expense, erect a benzol plant and the necessary additions for the purpose of recovering out of the waste products of the Citizens Gas Company the benzol and toluol so greatly needed by foreign nations as elements of explosives during the war. Out of this contract alone the Citizens Gas Company realized a clear profit of more than $1,000,000, all of which has gone to the benefit of the gas consumers of Indianapolis by enabling the Citizens Gas Company to continue the furnishing of gas at 60 cents per 1,000 cubic feet for several years longer than it otherwise could have done.

In May, 1921, due to the general rise in price levels, the rate of 60 cents per thousand cubic feet of gas was deemed by the Public Service Commission of the State of Indiana to be inadequate, and on the petition of the plaintiff, the Public Service Commission increased the gas rate from 60 cents to 90 cents per thousand cubic feet. After one year's experience under the 90-cent rate the Citizens Gas Company filed its petition with the Public Service Commission asking for a further increase of rate, which was denied by the Public Service Commission. Thereupon, on April 22, 1922, the Citizens Gas Company filed its bill of complaint in this court.

Before proceeding to analyze the accounts and computations that have been given in evidence, it seems to the master necessary and proper first to consider and determine the status of the industries other than gas production in which the Citizens Gas Company is engaged or with which it is affiliated, in order to ascertain whether, or to what extent, the figures or operation and valuation of such other industries ought to be included and become part of the figures of operation and valuation of the Citizens Gas Company. The other industries referred to are the Milburn by-products coal mining, the Pintsch gas manufacture, and the coke-oven by-products manufacture.

Basing Rates on Valuation

The master holds it to be the law for rate-making purposes that a public service company cannot include either in its figures of operation or its figures of valuation of the rate base, any items except such as are "used and useful for the public service." If the company engages in such other industries, it does so at peril that, if the industries are not useful to the public service and are unprofitable, the company cannot throw the burden upon the rate payers but must bear its own losses. In determining this matter, it is obvious that individual items or groups of items covering short periods of time are not controlling, but that a fairly long perspective, covering several years, must be taken.

At the time of the organization of the Citizens Gas Company in 1907, its competitor, the Indianapolis Gas Company, was operating a gas plant producing about two-thirds water gas and one-third coal gas; and it was having difficulty in disposing of even the small amount of coke that was produced as a by-product of its coal gas. The Citizens Gas Company availed itself of a process, then comparatively new, of making coal gas in vertical parallel retorts or ovens, with the result that it thereby produced a better grade of coke than that produced by the older process of the Indianapolis Gas Company, and thus created a greater market for its coke. Batteries of coke ovens were installed not only by the Citizens Gas Company, but also by its competitor, the Indianapolis Gas Company, so that coke ovens were an integral part of the plant of the Citizens Gas Company and also of the plant of the Indianapolis Gas Company, which came into possession and operation of the Citizens Gas Company in the year 1913. As has been hereinabove stated, it has never been possible to make gas exclusively by the coke oven process because the profitable operation of that process is limited by the market for the coke.

Produced Coke Oven Gas

It is established by the evidence and is admitted by counsel, that any production of coke oven gas within the above stated limits of economical operation reduces the cost of gas and tends to enable the company to furnish gas at a lower rate per 1,000 cubic feet. It is conceded that the investment in the property required for the coke oven process is a prudent investment. While it might be possible, in a rough way, to separate from all other property that property which is used solely for the coke oven process, it would not be possible to make any accurate, or even approximate, allocation of the expenses of operation as between the coke oven process and water gas process. Any attempt to make such allocation would at best be a mere guess. It seems clear that all the property required for the coke oven process and for all the by-products thereof is "used and useful for the public service" and that all of the expenses of operation thereof are "used and useful for the public service" and therefore the figures of operation and valuation of property are proper to be included in the cost of gas and in the rate base, and the master so holds.

It being established that the coke by-products industry is profitable, it obviously follows that the production of other by-products is profitable because, in each instance, the earnings are much greater than the expense involved and the material out of which the earnings are derived would otherwise be merely a waste product if not indeed an expense to the company. Therefore the master holds that the ammonia, coal tar, water gas tar, benzol, tuluol and miscellaneous by-products industries are profitable to the public service, and should be included in the figures of operation and in the rate base.

As against ratepayers, a public service company cannot, in its computation of expenses of operation, include any expenditures that are excessive or extravagant. The rate to be granted to a public service company to cover the cost of rendering the public service are upon the condition that there will be prudence and economy in the management of its affairs. If the company is wasteful or extravagant in the use of its operating revenue it cannot pass the burden to the ratepayers through an increase of rates sufficient to cover the wastefulness and extravagance, but must itself bear the entire loss.

Management Not Wasteful

A careful scrutiny by the master of all the evidence fails to disclose that any expenditure of the Citizens Gas Company has been wasteful or extravagant. On the contrary, the uncontradicted evidence is that the expenditures have been more than ordinarily prudent and economical. The payroll and salary lists have been shown to be somewhat less in amount than the average that prevails in other similar companies. The services of its board of trustees have been rendered without compensation and those of its board of directors for the merely nominal salaries of $50 per month. The prices paid for its coal and other supplies have been shown to be less than the average paid by other similar companies. The item of "unaccounted-for-gas," i. e., the unexplained shrinkage in number of cubic feet of gas that occurs between the holder and the consumers' meter, which in some companies runs as high as 10 per cent, has been shown in the case of the Citizens Gas Company to be below the average.

The master, therefore, finds that there has been no misuse, waste or extravagance in the expenditure of the funds of the Citizens Gas Campany.

Selects Test Year

Figures have been given both statistically and by way of graphic statement, covering the cost of gas at its various prices during the past years, going back as far as 1910. The objection to using past years or any average of them is that during none of the past years has the rate charged for gas been 90 cents a 1,000 cubic feet, and inasmuch as the fundamental questions in the case before the court is whether the rate of 90 cents a 1,000 cubic feet of gas is or is not confiscatory of the property of the Citizens Gas Company, it seems to the master that to use the figures of operation of such years as a measure would necessarily lead to erroneous results. It is to be taken into consideration that an increase in the price of gas naturally causes consumers to be more saving in its use and thereby causes a diminution in the average quantity of gas used by such consumer, and that this one item will have a very important effect upon the net cost of gas.

In view of the foregoing considerations, the master has deemed it the wiser course to select as the test period of operation the year beginning May 1, 1921, and ending April 30, 1922, during the whole of which year the rate of 90 cents a 1,000 cubic feet was in effect.

EXPENSES

Manufacturing expenses	$3,203,342.39
Coke, etc., sales expenses	81,648.36
Gas distribution expenses	236,402.39
Gas collection expenses	121,023.49
General expense	121,883.27
Taxes	265,139.85
Total	$4,029,439.75
Depreciation reserve	150,000.00
Total expenses	$4,179,439.75

CREDITS

Coke earnings	$1,657,359.88
Ammonia earnings	113,786.18
Coal tar earnings	88,535.05
Miscellaneous operating earnings	61,053.40
Benzol earnings	16,038.77
Pintsch gas earnings	5,669.16
Miscellaneous earnings	14,712.74
Total credits	$1,957,155.18

90-Cent Rate Confiscatory

The difference between the amount of gas earnings and the cost of gas as shown above represents the amount of money that would be applicable as profits to the stockholders of the Citizens Gas Company. This is to say it would represent the amount applicable for a fair return upon the property used and useful in the public service. This difference is found to be $133,809.69. This is only 1 1-3 per centum upon $10,000,000, which is the lowest valuation that has been placed upon the Citizens Gas Company property. Such a return is not a fair return but is obviously confiscatory. In other words, the rate of 90 cents per 1,000 cubic feet is confiscatory of the property of the Citizens Gas Company and the master so finds.

In order to ascertain what rate is the minimum that will not be confiscatory, it is necessary first to determine what is a fair percentage of return for the Citizens Gas Company.

The consumption of the gas in the city of Indianapolis in ten years has almost doubled. It is supposed that the progress of the city in the future and the increase in number of consumers of gas will be in the same proportion as in the past. The Citizens Gas Company will be called upon to provide the additional service for the added consumers in the near future and for that the Citizens Gas Company will be compelled to make capital expenditures and to that end to invite the investment of the additional capital needed to purchase and install the necessary equipment of machinery, mains and service lines.

It would be short-sighter and inimical to the interests of the citizens to fix a rate or percentage of return at a figure so low as to deter investors. In the nature of things, the figure must be such as will invite investment; otherwise the public service of the future must fail. The great weight of evidence is that the minimum rate or percentage of return that will enable the Citizens Gas Company successfully to invite the investment of additional capital that will be required for maintaining the public service is 7 per centum per annum. The master, therefore, finds that the Citizens Gas Company is entitled to 7 per centum per annum as a fair return upon its property and that the enforcement of any lower rate of return would operate to confiscate its property.

New York State Commission Makes Annual Report—

Outlines Work in Gas Industry in 1922

The Public Service Commission of New York has been singled out for attack by the new Democratic State Administration and, accordingly, considerable significance is attached to its report, for it is believed in some quarters that the commission may be legislated out of existence.—Editor.

The Public Service Commission of the State of New York presented its annual report to the Legislature on January 8. That portion of the report, which is taken from advance press copy that deals with the gas industry, is as follows:

Standards of Gas

The investigation begun by this Commission in 1921, under authority of section 66 of the Public Service Commission Law, into the matter of existing standards of the purity, illuminating power and heating power of gas, and the standards for the measurement of each thereof, manufactured, distributed or sold in the City of New York and suburban territory for lighting, heating or power purposes, was continued during the year 1922. The City of New York and all of the corporations serving the public with gas in the territory named were parties to the proceeding. Many hearings were held, expert witnesses were examined from this State and other states in behalf of the Commission, the City and the companies. In addition the Commission through its own gas experts carried on experiments and investigations for the purpose of enabling it to reach a just conclusion. The record of testimony in the case was in excess of 1800 pages. Hearings were closed on May 26, 1922. After all the evidence had been concluded, the Commission made a thorough examination of the same and prepared a comprehensive report under date of August 30, 1922, covering the entire subject. Such report will be printed with the Opinions of the Commission in Volume I of the Annual Report of the Commission for the year 1922.

As a result of its studies, the Commission found, in substance, that the test for candle power of gas was obsolete; that the candle power standard is representative of its value to the consumer only when used through an open-flame burner; that only a very small proportion of the gas utilized today is through the open-flame burner; that all other gas appliances, domestic and industrial, for cooking, heating and power purposes, function to employ the heating power of gas and not its luminous constituents; that candle power gas is of variable quality; that uniformity of quality is the first element of good service; that with a more uniform standard, private and industrial users as well would obtain better service; that better and more efficient illuminating service can be obtained through the use of mantle lights with gas of lower B. t. u. content than through the open-flame burner with a high candle power; that the B. t. u. standard is more economical for all present day uses; that a change from the candle power standard to a heat value standard would not adversely affect the gas service in the City of New York; that a change in the standard would not be accompanied by an increased use of gas, except in the case of utilization in a large industrial enterprise where scientific control is established.

The entire report was summarized by stating that the best gas service is obtained when an ample supply of constant quality gas is always available, and this condition is more easily secured under a reasonable heat value standards where the requirements approximate 500 to 540 British thermal units per cubic foot.

The Commission at the conclusion of this investigation adopted orders providing that the standard for gas furnished by the companies which were parties to the proceeding should be changed from a twenty-two candle power standard to a gas having a monthly average of not less than 537 British thermal units per cubic foot and a daily average of not less than 525 British thermal units per cubic foot on any three consecutive days in any month. The orders of the Commission also provided that until June 1, 1923, upon request of a consumer using open-flame burners for illumination, a gas corporation should furnish and install mantle burners at cost to replace open-flame burners, and that all necessary adjustments to appliances should be done free of charge to the users of such appliances.

The evidence taken in this proceeding showed that the British thermal unit standard, in addition to improving the efficiency in the use of gas by the consumers, would also effect certain economies in the cost of operation. The Commission believed that such economies in operating costs should inure to the benefit of the consumers. Thereupon further orders were adopted fixing the rates for gas furnished to general consumers by the companies affected. Schedules of higher rates filed by a number of companies had been suspended previously by the Commission pending the result of its investigations.

It is estimated that the changes in rates thus brought about by the Commission will effect an annual saving to the people of the City of New York of at least $5,500.000.

After making a reduction in rates for gas furnished in New York City and suburban territory, the Commission adopted orders fixing a uniform standard for gas in other parts of the State similar to the New York standard, the order as to each company direct-

ing a reduction in the price of gas furnished. These latter orders became effective as to thirty-one companies outside of New York City.

At the present time, manufactured gas, aside from that prescribed by certain small companies, is fixed throughout the State at the uniform standard of 537 B. t. u. The change of standard in New York City and suburban territory became effective on October 1, 1922, and in up-state cities, the new standard became effective on October 15, 1922, and subsequently as orders were made affecting the various gas companies. The standard for gas outside of New York City was changed from a candle power standard to a heating standard by order of the former Public Service Commission for the Second District, effective January 1, 1917.

Block Rates for Gas

The inquiry instituted by the Commission in 1921 into the question of block rates of a graduated scale of rates for industrial consumers of gas in New York City was continued in the year 1922. Hearings were held from time to time until May 26, 1922, when the hearings were formally closed. Expert witnesses were examined in this case and a number of exhibits received in evidence. The questions involved in the inquiry were twofold: (1) Whether the uniform rate should be abandoned and a graduated schedule substituted, and (2) if so, how a graduated schedule should be constructed.

On the basis of the evidence taken, the Commission found that the most scientific method of prescribing rates for gas was one in which the cost of rendering service to each consumer is determined by the actual cost to the company for rendering that service. Of course it would not be practicable to impose such a standard of rate-making, and no commission, anywhere, has thus far attempted to do so, although much consideration has been given to the subject. The Commission's final conclusion was a statement of belief in principle with the view that the lesser cost to the company in serving the large industrial consumers justifies a differential based on the quantity of consumption. It appeared to the Commission that the course which would prove the fairest and not unacceptable to the consumers was the one that would reduce prices to the smaller consumers and at the same time recognize the differential noted. A system of rates on that basis was therefore fixed and established by the Commission.

Effect of Coal Situation on Gas Industry

The coal strike affected the gas business seriously. The majority of the corporations made such provisions in advance as they deemed essential, but it soon became apparent that the strike was to be of longer duration than was anticipated. The water gas companies especially were confronted with serious problems. Their stocks of coal were depleted to a dangerous point on about the 1st of August. Many of them were compelled to resort to the use of coke in place of anthracite, and this commodity soon began to become scarce. The future was not at all bright when the anthracite strike was finally settled.

In order to do all that could possibly be done to avert a cessation of operation of the gas as well as the electric corporations, a committee composed of representatives of the municipalities, the gas and electric corporations, and the Commission, was appointed which had for its chief purpose co-operation with the Governor's emergency fuel committee. This utility committee began operations early in August, laid plans, and adopted measures which were designed to insure as fully as possible that the available fuel would be distributed equitably and promptly. It is believed that this committee was the first of the character to begin to function, following the time when it became apparent that the fuel situation was desperate. In fact, it was found that when a federal agency was finally made operative, the committee representing the interests in New York State had means at its command to make effective immediately any directions coming from the federal source. In addition, data respecting the needs of the various corporations throughout the State was secured and, where necessary, the smaller corporations were effectively assisted to secure the fuel they needed. The work done by this committee in co-operation with the Governor's emergency committee paved the way for the prompt alleviation of a critical condition, and undoubtedly prevented the cessation of operation of a number of the corporations.

The strike has had another effect upon the gas industry. The limited amount of domestic and steam size anthracite available has resulted in an unusual demand upon the gas corporations through the utilization of gas for domestic heating. Undoubtedly the result of this use will be that it will be continued, so that many of the corporations will soon find that they must needs increase their plants if they expect to be able to cope with the situation. Many of the water gas corporations will find it expedient and desirable to supplement their existing plants by either straight coal gas or by-product coke oven plants. In any event, the anthracite situation cannot be expected to improve due to the increase in the amount required for domestic use and the gradual depletion of the available supply. If the public is not to be confronted with increased rates, the corporations must adopt means which will enable them to produce gas without the use of anthracite.

Testing of Gas and Gas Meters

With the increased demand for gas, has come an increase in the number of meters which the Commission has been required to test. The testing of all gas meters in use is a statutory requirement, and during the first ten months of the year, 532,514 meters were tested. This is the largest ten months in the history of the Commission. The available meter testing force is severely taxed to cope with the demands, and the future seems to promise even greater demands. Likewise the necessity for continually testing the gas for heating value requires an extensive amount of work. Notwithstanding the difficulties encountered during the strike, the quality of gas furnished was satisfactory. The change in New York City from the candle power to the heating value standard has brought with it the necessity for constant testing, and a force has been organized which

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As the Journal Views It

Municipal Ownership Again to the Front

While many cities throughout the United States are learning the bitter lesson of failure of municipal ownership, there are other cities that are seriously considering the question, with the announced object of taking over and managing the public service companies. This is notably true in certain sections of the East, and it seems as if the experience of other sections will not act as a deterrent.

The New York State Conference of Mayors have presented to the Legislature a request that certain laws be amended and power given to municipalities to take over the local utilities where it is deemed advisable. Governor Smith in his annual message to the law-making body recommends the abolition of the Public Service Commission of the State and handing over to the cities the power of regulation over all utilities whose activities are confined to a community. This is just a step toward municipal ownership, according to those in touch with political trend.

We have been and still continue to be unalterably opposed to municipal ownership in any form. We are willing to admit that in some communities it has been successful, but that does not prove that it will be successful in others. In the preponderance of cases, also, it has proved to be a miserable failure, and reports that cities are seeking buyers for their plants are constantly being received.

Simultaneously with the announcement from Albany that the public utility question is to be fought out in vigorous fashion, comes the announcement from the Consolidated Gas Company of New York that it is inviting its customers to become partners by means of the purchase of securities. Its announcement that it would sell an issue of preferred stock direct to its customers and employees aroused a great deal of interest and it was predicted that the issue would be over-subscribed many times.

The entire industry will watch this experiment of the Consolidated Company with a great deal of interest, for it is the best answer in the world to carping politicians who see in municipal ownership a huge amount of patronage for the "faithful" within the party.

We believe it is doubtful if municipal ownership will get very far this year in New York State, but the agitation is there and it should be combatted.

Using the "Journal" in Educatng Your Public

A statement made recently by one of our readers interested us very greatly, for it showed that he was taking advantage of the material we are publishing in a way that will show direct results. This reader stated that each week he goes through the JOURNAL with the thought of picking out matters of interest which he prepares for his local newspapers. He finds, he says, that the local newspapers welcome this service and a very great deal of what he offers is printed and read. He knows it is read because the customers of his company frequently remark having seen some certain item.

While it is true that most of what is printed in a magazine of the nature of the AMERICAN GAS JOURNAL is of only slight interest to the general public, there are many facts that are brought out that are interesting to all. The writers for the JOURNAL are all men who know whereof they speak and write and the result is that all of the statements have a ring of authority that cannot be questioned.

We don't know how general is the practice that this man described, but we believe that it could be made very general indeed with remarkable good resulting. We would like to hear from our readers as to how they handle this matter and what the results are, for we would like to pass it on to the other fellow.

Association Announces Prize Contest

The Empire State Gas and Electric Association has announced through its Advertising Committee a prize contest, open to all, for the best advertising slogan describing in ten words or less the value of gas service. Four prizes of $50, $25, $15 and $10 will be given.

Also $5 each will be paid for all accepted statements of about 100 words explaining why gas service has such big value. The committee, it is stated, expects to accept at least 50 statements in regard to gas service.

Slogans and statements should be submitted through each local company to the Advertising Committee of the Association. Each slogan and statement submitted should be written on a separate sheet of paper with the name and address of the sender.

Contest closes January 31, 1923, and prize winners will receive checks as soon thereafter as possible.

The headquarters of the Association are in Grand Central Terminal, New York City.

N. Y. State Makes Annual Report

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will be engaged in performing this work. Tests of the gas supplied by each corporation will be made at least three times each day at intervals of not less than three hours, at testing stations which have been supplied by the corporations for this purpose, in accordance with the requirements of the order.

Natural Gas

It is estimated that approximately three-fourths of the total amount of natural gas used in this State is purchased from corporations outside of New York State. Some of the foreign corporations which have been supplying natural gas in the State have from time to time increased their rates and others have even sought to withdraw entirely from doing business within this State. Investigations which have been made during recent years both by the National government and State agencies show that the supply of natural gas within New York State has become depleted and that the average production has decreased steadily since 1917, in which year the peak of production of natural gas in the eastern fields appears to have been reached. In 1917, for example, the Iroquois Natural Gas Company of Buffalo distributed fourteen billion feet of natural gas. This record has never again been reached and the distribution has decreased on an average of about one billion feet per year. A greatly lessened supply has been experienced by the Republic Light, Heat and Power Company, the Elmira Water, Light and Railroad Company and all other companies distributing natural gas. The Elmira Company received authorization from the Commission to construct a water-gas plant to augment its natural gas supply. The Iroquois Company was authorized to purchase coke oven gas and furnish mixed gas and an immediate merger of this company and the Niagara Gas Company was directed by the Commission in order to meet the needs of consumers. Sooner or later the growing demand for manufactured gas will require the construction of plants of much larger capacity with improved machinery and appliances.

In the investigation made by the Commission in the Iroquois case, it was testified by one well informed witness from Pennsylvania that the supply of natural gas from that State (much of which comes to this State) would cease entirely within five years. It was also testified that the New York State fields probably would be exhausted within ten years. Those who have studied the situation believe that within a very few years the use of natural gas will be entirely superseded by the use of other commodities. Many perplexing problems from the standpoint of the Commission, the distributor and the consumer are arising and will continue to arise during the transition period.

Effect of Fuel Situation on Gas Industry

Memorandum Presented to U. S. Commission

The following was presented by Col. Oscar H. Fogg, Secretary-Manager of the American Gas Association, to the United States Coal Commission. Col. Fogg as a member of the Joint Committee on Public Utility Fuel, outlined the coal needs of the gas industry. To our way of thinking, this is the clearest and most comprehensive statement that has ever been made on this subject.—Editor.

This memorandum of the American Gas Association is supplementary to that of the Joint Fuel Committee of the three utilities associations. This commission has thus already heard a fair statement of the general fuel problems which confront the manufactured gas industry. However, the situation with respect to fuel for gas manufacture is particularly complex, and there are certain problems peculiar to our industry which it is believed should receive special consideration.

Before taking these up, however, it is desired to stress two matters of general importance: First, we wish to point out that we are here as members of the public, and in a sense as representatives of over 48 million persons who use our service directly or indirectly. We particularly represent the householder. Of this 9,200,000 consumers of manufactured gas, probably 9,000,000 would be classed as domestic users, families which use gas for cooking, lighting, heating water, etc. Our rates are regulated by public authority, and the return on our investment is usually no more than absolutely required to attract the new capital necessary for adequate service and expansion. Thus any increased cost of production due to high coal prices must be passed on directly to our consumers. If rate increases are tardily granted, adequate service cannot long be maintained. The householders will eventually be called upon to pay any increased cost of coal either in money or impaired service, and in asking consideration of our case we are at the same time asking consideration of theirs.

Secondly, the continuity of gas service must be maintained, the supply must not be allowed to fail even for a minute. The failure of electric light and power or street railway service may be indeed serious, but the resumption of gas service after an interruption is attended with danger of fatal accidents to consumers. In order to guard against any possible service interruption gas companies go to great expense to provide duplicate or spare apparatus

wherever there is chance of breakdown. They provide large gas storage capacity at great expense. Finally, they make it a practice to carry probably larger stocks of fuel than any other class of consumers. As a result we know of no industry in the world where service is or must be more continuous and dependable. But it is self-evident that continuous service cannot be properly insured without an adequate and reasonably continuous supply of fuel.

Reasonable coal prices and uninterrupted coal supply are vital to the manufactured gas industry and to the welfare of the public which it serves.

Yet when a disturbance in fuel production occurs and normal channels of supply are deranged, the gas industry finds itself in a particularly difficult position. Our obligations to the public are heavy, while at the same time the grades of fuel which we can use for gas manufacture are very restricted. Thus cancellation of contracts, interference with normal supply either through cessation of mining or through transportation disability, or diversion or confiscation of our fuel is particularly disastrous. It is our desire to lay this situation before this commission, stating briefly our requirements as to quality and quantity of fuel and the difficulties we have experienced during the past few years in obtaining it.

It should be appreciated that gas manufacture is a chemical process in which coal or coke are raw materials. In only a part of the process are they burned as fuel. It may be appreciated, therefore, that much fuel entirely satisfactory for steaming purposes is useless for gas making.

Outside of the Pacific Coast and certain of the Southwestern states, where oil gas is extensively used, there are two main processes of gas manufacture—the coal gas process and the water gas process.

Neither the water gas nor the coal gas process is localized to any one section of the country; and except in those states where the oil gas process is used almost exclusively, there are generally both coal and water gas plants. Many of the larger gas companies have both coal and water gas equipment, since the coke produced in the manufacture of coal gas may then be used for water gas production. The smaller plants, however, more often employ but one of these processes.

Water Gas Generator Fuel

Generally speaking, anthracite coal and coke for water gas manufacture are interchangeable, the use of the former being confined almost entirely to the New England and Middle Atlantic States. The use of bituminous coal is localized to certain of the Middle Western States, the necessary requirements as to its quality are somewhat severe, and it need not be considered an important factor in our water gas fuel problem at the present time.

During the recent cessation of mining supplies of anthracite suitable for water gas manufacture became unobtainable, and gas companies were generally forced to substitute coke. While the price was high there was, generally speaking, no very serious difficulty in obtaining it. However, had it not been for the large stocks accumulated by the by-product oven companies during the recent industrial depression, the shortage of fuel for water gas operation would probably have been very serious.

A part of the coke used in water gas manufacture is regularly made by the gas companies themselves, but it must be appeciated that a large proportion of it is produced in beehive and by-product ovens. Thus the gas industry is directly dependent upon commercial coke oven companies for a substantial quantity of its necessary raw material, and these companies must in turn have high-grade coking coal. It is essential that coke oven plants serving our industry be maintained in operation.

Furthermore, the quality of the fuel for water gas manufacture is important. It must be of proper size, low in sulphur, reasonably low in ash, while the fusing temperature of the ash should be within certain specified limits. This imposes restrictions upon the quality of coal from which coke for water gas may be made in addition to those limitations which necessarily apply when the gas produced is distributed for city consumption.

Finally, we particularly wish to call the attention of the commission to the effect of disturbances in coal production upon the price of beehive and by-product coke. This is clearly shown on the two charts herewith attached. These require no explanation. It should be noted, however, that coal gas companies having surplus coke for sale usually dispose of it on contract or locally for domestic purposes, since the quality of the coke and the nature of their business make this desirable. They, therefore, do not usually benefit greatly from peak coke prices, whereas many water gas companies find it necessary to pay them.

Gas Coal

Our most serious coal problem is that of gas coal supply. In addition to the 5,900,000 tons required last year by gas plants themselves we estimate that at least 5,000,000 tons more were needed by by-product ovens supplying utilities with coke for water gas manufacture or with gas for city distribution. All coal and water gas plants, except water gas plants using anthracite, are dependent directly or indirectly on gas coal. With the supply cut off their operation must cease.

Gas coal must conform to rather rigid specifications as described in the appendix. It must be low in sulphur, have proper volatile content, be reasonably low in ash, and have good coking properties. Otherwise its use in gas manufacture will give rise to operating difficulties or produce seriously uneconomical results. Coals from Ohio, Indiana, Illinois and Kansas, for example, are generally entirely unsuited for gas or coke manufacture.

The principal gas coal fields east of the Rocky Mountains lie in Western Pennsylvania, West Virginia, Eastern Kentucky, Virginia, Tennessee and Alabama. The three former are by all means the most important. There is included in the appendix an outline of the normal lanes of gas coal transportation and the regions which each one of these fields normally supplies.

These transportation routes are the result of slow growth and economic development. Whether or not the general scheme might be improved were we free to plan it today is an academic question. Plants have been built both as to general type and as to detail of construction to make economical use of coal ob-

tained under existing conditions and any attempt to change these conditions artificially has been little short of disastrous to the gas companies. For example, during the zoning restrictions of the Fuel Administration they were forced to use coal entirely unsuited to their purposes, and as a result their plant capacities were often dangerously reduced, their operating costs mounted, and they frequently found it impracticable to comply with the regulations as to gas quality fixed by State commissions after careful consideration of what consumers might reasonably expect as adequate service.

During partial cessation of mining operations these normal lanes of transportation always become deranged and gas companies suffer severely not only from actual shortage and high prices of fuel, but also from the inferior and unsuitable quality of that which they do obtain.

Furthermore, during each coal disturbance since the war the gas industry has suffered greatly because of the confiscation of gas coal by the railroads. On account of its special qualities, gas coal is usually particularly scarce during times of general shortage, and its replacement is correspondingly difficult.

Association Protested

The American Gas Association protested vigorously against the confiscation of gas coal before the Bituminous Coal Commission in February, 1920. Nevertheless during the past summer many serious cases of confiscation have occurred, at least one of which resulted in disaster, the gas plant in question having been forced to shut down entirely. This situation could and should be promptly remedied.

Our general difficulties have been adequately covered by our Joint Fuel Committee. We have, however, tabulated them as follows:

1. Failure to receive coal because of cessation of mining and the consequent nullification of contracts.
2. Failure to receive full contract supply during times of fuel disturbance even though mines in question may be in operation. This condition apparently may be the result (a) of the mine having orders in excess of its capacity with consequent pro-rating of production, or (b) failure of the mine to receive adequate car supply.
3. Failure to receive coal because of railroad congestion or other transportation disability.
4. The confiscation or diversion of coal after shipment.
5. Excessive prices demanded for spot coal. On account of general failure to receive contract coal these prices must usually be paid.

To this list must be added the diversion of gas company contract coal on priority orders. During the past summer this resulted in serious difficulty, expense and dissatisfaction.

Our Joint Fuel Committee has made such suggestions as we deem proper in the matter of improving the situation. In addition, however, we urge that no action or recommendation be made which might lead to interference with the normal flow of gas coal to those who most need it, but, on the other hand, we ask that you recognize the special needs of the gas industry and the coke industry at least as far as the gas industry is dependent upon it. Clearly, this is consistent with public welfare and the conservation of national resources for their most essential uses.

Gas coal is vital to the gas industry. We must have:

1. An adequate supply; otherwise our service cannot be rendered.
2. A quality suited to our special needs; otherwise our service will be poor and expensive, and we must be able to obtain it at
3. A reasonable price; otherwise the public will be obliged to pay more for gas.

Finally, we wish to point out again that our service must never fail. That is a tradition in our industry and a necessity for the public welfare. Yet we, who must render perhaps the most dependable service in the world, are compelled to rely for our raw material upon the coal industry which has become of recent years notoriously intermittent in its operation. From the standpoint of the gas industry and the public which it serves and indirectly represents here it is particularly important that our fuel supply be stabilized.

Extending New Year's Greeting!

Using a full page of the Denver newspapers, the Denver Gas and Electric show the midnight hour, by its stars and moon, the baby of the New Year ringing the bells and then within a holly wreath we read:

> "We feel that the year should not pass without some expression of our appreciation of the cordial relations with those whom we have had the pleasure of serving during the past year.
>
> "And, now that the holiday season is at hand, laden with its spirit of good-fellowship, let us convey to you, with our deep appreciation of these relations, the season's wishes for your health, happiness and prosperity."

Prevention of Waste from Gas Leakage

Small leaks in house piping and appliances waste more gas than is usually realized, as a leak wastes gas every minute of the day, and a leakage of 1 cubic foot per hour means 8,760 cubic feet per year, states the Bureau of Mines in Technical Paper 325, just published. Such leaks are also a source of danger from explosions and fires. Most gas meters have a small dial indicating one-half, 1, or 2 cubic feet of gas per revolution of the hand, and one of the uses of such dials is to detect leakage. From time to time, consumers should shut off all appliances and note whether the hand on this dial moves during a period of two or three hours. Meters do not move unless gas is passing through them, hence if the hand continues to move it is conclusive evidence that gas is leaking somewhere on the premises. Gas leaks may be found by brushing the pipe and appliances with soapy water, as escaping gas will form bubbles. Fire should never be used in searching for leaks, as this is dangerous. Leaks may be stopped temporarily if they are covered with soap and the pipe wrapped with tape or a cloth bandage, but a pipe fitter should be called immediately to make permanent repairs.

Syd's Scribblings

What's Happening?

Brooklyn Has Disastrous Fire.
Because He Called His Friend a Liar.

Student Doctor Weds a Nurse.
A Million Germs They Will Disperse.

Jersey Jury Can't Agree.
Sheriff Gets Tremendous Fee.

Hoover Only Grape Juice Drinks.
Three Were Pickled, Schooner Sinks.

Well Known Woman Gets Divorce.
Electric Wiring Bad, of Course.

If you have read this crazy rhyme
You have discovered by this time
That I just copied headlines bright
And saved myself some work last night.

"Nothing But the Truth"

A Play in One Act

Cast of Characters

A. Commuter..Cross, furnace out of order.

A. Farmer.....Very inquisitive.

Scene: Seat in the smoking car of the 8:33 Long Island train.

Farmer

Travel on this road purty often?

Commuter

Yes.

Farmer

In business of some kind, like as not?

Commuter

No, I work for another man.

Farmer

Dry goods business?

Commuter

No, wet goods.

Farmer

Bootlegger?

Commuter

No, fish market.

(SILENCE)

Farmer

Find it cheaper to live out of the city?

Commuter

No, dearer.

Farmer

Rents are cheaper, ain't they?

Commuter

Yes.

Farmer

Groceries and things don't cost any more, do they?

Commuter

No, they cost less.

Farmer

Then what makes it dearer?

Commuter

Running for trains, wear and tear on shoe leather.

(SILENCE)

Farmer

They pay bigger wages in the city than what they pay in the suburbs, don't they?

Commuter

Yes.

Farmer

What might it be worth now to hold a job like yours?

Commuter

The man I work for pays me two hundred dollars and ninety-nine cents a week.

Farmer

Always makes the exact change?

Commuter

Always.

Farmer

What's the idea of making it just two hundred and ninety-nine?

Commuter

He pays me two hundred dollars for my work and ninety-nine cents for minding my own business.

A Peddler's Dream

I was lying on a divan, a pillow comfortably arranged beneath my head and a magazine in my hand. The room was very warm. Heavier and heavier became my eyelids, the magazine dropped from my fingers and I was fast asleep. I wandered through dreamland, that vast domain where happiness is cheap.

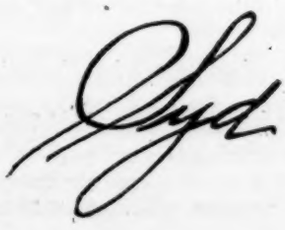
I was a peddler, selling "Shredded Sawdust," a breakfast food guaranteed to cure indigestion in two weeks. No competitor had ever been in that territory. The merchants bought my wares in large quantities, never asking for a cut in price or a little extra dating.

The hotels were large and roomy, even the clerks were polite. They answered questions without a frown or a scowl. Waiters and bell boys were so polite they made it appear that it was a pleasure to serve me and became offended if I offered to tip them.

All the towns were clean and healthy. A peddler was considered a man of learning, a man of standing and one to be cultivated. Every home was open to him and a father was happy when he saw his daughter promenading down the principal street with a peddler.

My expense account was unlimited and unquestioned. My check was never delayed. I forgot to mention that I had an annual pass on all the railroads, a fact, about which my house knew nothing.

One day I was going from Albany to Troy. Suddenly I heard an awful crash. I seemed to be travelling through space at the rate of a million miles a second. Then there came a jolt, followed by a dreadful pain through my body. With fear and trembling, I opened my eyes and found myself lying on the floor. As I picked myself up and went in to dinner, to my mind came that beautiful and yet pathetic little chorus: "Oh, What a Beautiful Dream."



Public Utilities Securities Market Report

Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

Company.	Jan. 11, 1923	Maturity	Jan. 11, 1923 Bid	Asked
American Lt. & Trac. Co.	Five Year 6s	May 1, 1925	109½	110½
Brooklyn Union Gas Co.	First Consol. 5s	May 1, 1945	99	100
Columbia Gas & Elec. Co.	First 5s	May 1, 1923	96	97
Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore	First Ref. 7½s	Dec. 1, 1945	110	111
Consol. Gas, Elec. Lt. & Pr. Co.	General 4½s	Feb. 14, 1935	92	93
New Amsterdam Gas Co.	First Consol. 5s	Jan. 1, 1948	84	86
Denver Gas & Elec. Co.	Gen. (now 1st) 5s	May 1, 1949	92½	94
Detroit City Gas Co.	Gold 5s	Jan. 1, 1923	—	—
Equitable Illum. Gas Lt. Co. of Philadelphia	First 5s	Jan. 1, 1928	101½	103
Hudson County Gas Co.	First 5s	Nov. 1, 1949	94⅛	—
Laclede Gas Light Co.	Ref. & Ext. 5s	Apr. 1, 1934	94½	95
Louisville Gas & Elec. Co.	First & Ref. 7s	Called Dec. 1	100	—
Michigan Light Co.	First & Ref. 5s	Mar. 1, 1946	91	92
Milwaukee Gas Light Co.	First 4s	May 1, 1927	93	93¼
Pacific Gas & Elec. Co.	Gen. & Ref. 5s	Jan. 1, 1942	92¾	93
Pacific Gas & Elec. Co.	First & Ref. 7s	Dec. 1, 1940	105½	—
Cal. Gas & Elec. Corp.	Unif. & Ref. 5s	Nov. 1, 1937	97¼	98
Peoples' Gas Lt. & Coke Co.	Refunding 5s	Sept. 1, 1947	92½	93½
Chicago Gas Lt. & Coke Co.	First 5s	July 1, 1937	95⅞	—
Portland Gas & Coke Co.	First & Ref. 5s	Jan. 1, 1940	90½	92
Seattle Lighting Co.	Refunding 5s	Oct. 1, 1949	83	85
Southern California Gas Co.	First 6s	Nov. 1, 1950	97	99
Utica Gas & Electric Co.	Ref. & Ext. 5s	July 1, 1957	92	94
Washington Gas Light Co.	General 5s	Nov. 1, 1960	95	96
Western States Gas & Elec. Co. of California	First & Ref. 5s	June 1, 1941	91	93

November Earnings of Atlanta Gas Co.

Net earnings of the Atlanta Gas Light Company jumped to figures a little above the average during November, after being off for several months.

The earnings were $44,577.56, compared to less than $30,000 per month for the three preceding months, according to reports filed with the Georgia Public Service Commission. November, December, January and February are the best months in the year for all gas companies.

The detailed report for November follows:

Revenue from gas	$181,963.80
Other revenue	1,824.80
Total revenue	$183,787.88
Production expenses	$76,914.80
Transmission, etc.	15,876.98
Commercial	9,601.55
New business	3,046.64
Miscellaneous	16,316.45
Depreciation	10,253.90
Taxes	7,200.00
Total expenses	$139,210.32

Gas Mergers Approved

Trenton, N. J.—Merger of four companies into the Elizabethtown Water Company, Consolidated, and of a similar number of utilities going to make up the Elizabethtown Consolidated Gas Company, together with the issuance of capital stock aggregating $7,875,000, have been approved by the Public Utility Commission.

The Rahway Gas Light Company, the Metuchen Gas Light Company, the Cranford Gas Light Company and the Elizabethtown Gas Light Company constitute the merged Elizabethtown Consolidated Gas Company. The commission has authorized the latter to issue capital stock of $3,875,000.

The value of the property of the four gas companies as of October 31 last is placed at $4,783,498.91, subject to liabilities amounting to $557,739,72, including current liabilities of $357,739.72 and $200,000 funded debt.

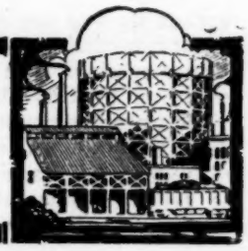
Nearly 18 Miles of New Gas Mains Laid in Rochester

Rochester, N. Y.—Almost three times as many feet of gas main were laid in 1922 as during the preceding year, according to figures prepared by Joseph Haftenkamp, superintendent of the gas department of the Rochester Gas and Electric Corporation. In 1922 the mains of the company were extended 93.417 feet, or nearly eighteen miles, while only 54,257 feet were laid in 1921.

The pipe used for this purpose ranged in size from four to twenty inches. The Sea Breeze extension formed one of the most extensive projects involved in the year's work.

The number of houses supplied with service pipes during the year totaled 2,522. In addition, 1,111 "stubs" were put in. These stubs are laid when new streets are built, and consist of pipes of the ordinary service size extended as far as the inner edge of the sidewalk. They are put in before the pavement is laid, and enable the workmen of the company to install the completed service when a newly-built house demands it without the necessity of tearing up the sidewalk. In 1921, only 303 stubs were installed, an evidence, Mr. Haftenkamp said recently, of the large number of new streets opened in Rochester during the past year as compared with the previous twelve months. The combined length of services and stubs is equivalent to 82,358 feet of piping, the largest amount laid during any one year since 1913.

NEWS OF THE GAS INDUSTRY



S. B. Thompson Has New Position with Bangor Gas Company

Stroudsburg, Pa.—S. B. Thompson, who has been connected with the Citizens Gas Company of Stroudsburg for some time, has been named as the new manager of the Bangor Gas Company, at Bangor, Pa., and assumed active control on January 2nd. The Bangor Gas Company is constructing a new holder, and is in reality building an entire new plant.

Mr. Thompson will reside in Bangor, his many local friends being sorry to see him leave the Stroudsburgs. He has been a prominent figure in the Men's Club of the Christ Episcopal Church and is a member of the Stroudsburg Kiwanis Club.

Owosso Gas Company to Serve 5 More Cities

Owosso, Mich.—Plans of the Owosso Gas Company to install a high-pressure system, which would greatly increase the capacity of its plant here, and supply Corunna, Vernon, Durand, Ovid, and probably St. Johns, with gas, have been made public, by R. P. Wagner, of Alma, new owner of the company. Wagner is president of the Gratiot County Gas Company, which supplies all of the towns in Gratiot County. He asserted that, with the increased production necessary to serve the additional cities, gas rates would be lowered in Owosso.

F. C. Shenehon Made Vice President of Byllesby Organization

H. M. Byllesby has announced the appointment of Francis C. Shenehon as vice president and general manager of the construction and engineering of the Byllesby Engineering and Management Corporation, with headquarters at Chicago, effective as of January 4, 1923. F. H. Lane, manager of engineering and construction, will remain in his present position as Mr. Shenehon's ranking assistant.

Mr. Shenehon, as consulting engineer, has performed important services for the United States Government, the Niagara Hydraulic Power Company and the Chicago Drainage Canal. For eight years he was dean of the college of engineering and architecture of the University of Minnesota, of which he is a graduate, class of 1885.

C. E. Marentette Dead

Chas. E. Marentette, general sales manager of the Art Stove Co., Detroit, Mich., died suddenly on Friday, Dec. 29, at his home. Funeral services were held on Tuesday, January 2.

Mr. Marentette had been associated with the Art Stove Company for twenty years; for the past fifteen years as general sales manager, and was well known to the hardware and furniture trade of the United States.

Mr. Marentette is survived by his wife and four children.

People Vote for Higher Rate

The people of Shreve, Ohio, have voluntarily voted to boost their rates for natural gas from 35 cents a thousand cubic feet to $1 for the first thousand cubic feet and 50 cents per thousand for all in excess of 1,000 cubic feet.

The gas users of Shreve were being supplied with this valuable fuel at 35 cents a thousand cubic feet under a franchise that still had two years to run. However, when the gas company explained that it was losing money under the old rate, the City Council passed a new grant boosting the rates. Voters have approved this new grant, effective at once, at a referendum election by a vote of 375 in favor of the increase, as against only 165 opposed to it.

N. Y. State Mayors Favor Municipal Ownership

Albany, N. Y.—The Mayors' Conference, an official organization composed of mayors of various cities of the State of New York, in convention assembled at Albany on January 5, handed down a series of 17 radical recommendations, quite in keeping with the trend of political times and almost going one better the recommendations of the Democratic State platform at Syracuse.

Its recommendations on utility legislation accept the fact that there might be some constitutional limitation on municipal owned public utilities and therefore it is suggested that the constitution, among other things, be amended. The recommendation on this subject reads:

"Utility Legislation.

"We urge the Legislature to repeal those provisions of the Public Service Commission Law which now deprive localities of the right to enforce terms of existing franchises.

"We urge the Legislature to approve a concurrent resolution proposing an amendment to the Constitution, giving to municipalities the right to acquire, construct, own, lease and operate within or without their corporate limits any public utility the product or service of which is or is to be supplied to the municipality or its inhabitants, and to enter into contract for any such product or service."

The Public Service Commission program of the administration is still in the making. It was not introduced at the opening of the session because it has been discovered it is a physical impossibility to rip to pieces the old Public Service Commissions Law, the Rapid Transit Act and abolish powers, rights and jurisdiction which have existed for years and do it with safety or sanity all in a day or so. Work is progressing on these measures, however, with the ultimate end in view that so far as New York City

is concerned it is to be allowed to regulate its own public utilities by a transit commission and a public utilities commission. The authority is to come from the City Charter.

The transit commission or department, which ever it may be called, will regulate all transit matters, and the public utilities department or commission will supervise gas and electricity, telephones and steam.

Then various cities of the State are to be given an option to regulate for themselves and at their own expense public service corporations operating within their limits.

The present Public Service Commission is to be reorganized, according to the present intent of the administration and the message of the Governor, into a commission of three members.

Whether or not the newly enacted public service commission law will strip the commission of its opwer to raise or lower a rate, charge or condition, regardless of any existing provision of law, general or special, or the existence of any franchise, agreement or ordinance to the contrary, is a matter that as yet has not been determined.

The disposition of the Legislature at the present time seems to be, if the measures presented are fair in their conception, to accord to the City of New York the right to regulate its own public utilities and to pay for them and to grant a sort of an optional right for other cities to adopt a similar program, but there are many in the Legislature who are opposed to doing away with the present Public Service Commission or to strip it of any of its powers or judicial authority.

Congress of Washington is to be asked to pass appropriate legislation restraining Federal judges from issuing injunctions interfering with the carrying out of the provisions of the Public Service Commission Law, especially in the case of a public service corporation which has been requested by the duly constituted authority of the Public Service Commission to do certain things, and ignoring its right to review by certiorari of the action of such commission, has secured an injunction from the United States Courts restraining the carrying into effect of the order of the Public Service Commission. It will be contended by the Legislature, in the same manner that the Public Service Commission itself is now contending before the United States Courts, that under any system of equitable justice, the power of the Federal Courts should not be invoked until the remedies afforded by appeal to the courts of this State have been had.

The bills which will be introduced by the administration will be viewed with much interest, but that they will be so drawn as to present little chance of their being declared unconstitutional seems certain from the conservative method by which the present law is being dissected in order to build up the new.

Refuses to Allow Commission to Examine Books

Birmingham, Ala.—The Mobile Gas Company has declined to permit Alton D. Adams, consulting engineer Alabama Public Service Commission, to make an examination of the books, documents and records of the company, despite the fact that the company has been formally ordered by the commission to permit the examination.

This information became public following the definite refusal of the company in Mobile when Mr. Adams presented his credentials and demanded the books and records Friday.

In an order issued January 3 and made public in the ordinary course of the commission's business, Mr. Adams was directed to proceed with the inspection and investigation of the records of the company. This order was not sufficient and the company declined to permit such an examination.

Another order, dated January 4, was issued, in which the company was specifically ordered and directed to permit the examination. This order was presented by Mr. Adams, but the company again declined to permit the examination.

A. G. Paterson, president of the commission, and B. H. Cooper and S. P. Galliard, asosciate commissioners, were absent in Birmingham Friday and could not be reached for a statement regarding the procedure which the commission will take in an effort to enforce its order for the examination.

In directing officers of the Mobile Gas Company to permit the examination of its record, the second order said:

"It is further ordered by the commission that said Mobile Gas Company and R. I. Sheer, as manager thereof, and any and all other officers, be and they are hereby ordered, directed and commanded by this commission immediately upon delivery or service upon or any of them, of a copy of this order duly certified under the hand of the president of said commission and under the seal of the commission to produce at the offices of said company in Mobile, Ala., all books, records, accounts or documents of said company and especially all such records, books, accounts, or documents which are in the control of said company and in this State, in order that commission may proceed with this further investigation of such books, records, accounts and documents, and that said company and R. I. Speer, its manager, and any other officers or agents having charge thereof, permit and allow the said Alton D. Adams and such assistants as are employed and used by him and under his direction and supervision for such purposes, together with the retained engineers and accountants of this commission, and such other persons as the commission may be proper and legally authorized for such purposes to investigate and examine at reasonable times and in a reasonable manner, all or any of such books, records, accounts, books or documents."

Monument to Discoverer of Monroe Gas Field

Delegates from the Monroe Civic League request that Monroe citizens backing the proposition for the erection of a monument to the memory of Louis Locke, discoverer of gas in the Monroe, La., field, join with them in their efforts begun some time ago to provide a suitable memorial to the man to whom credit is due for the opening of the Monroe field.

The Monroe Civic League Committee has accumulated a considerable nucleus for the Locke memorial fund and has suggested that a park containing a fountain be established in memory of the gas discoverer.

Lower Gas Rate for Cambridge

Cambridge, Mass. — The Cambridge Gas Light Company has notified the Department of Public Utilities that its board of directors has voted to reduce the price of gas from $1.30 to $1.25 per 1,000 cubic feet, the reduction to take effect Feb. 1.

Lewiston Gas Light Co. in Good Shape

Lewiston, Me.—Of the several public utility corporations in the State, probably there is none that has weathered the storm of war and post-war conditions in better shape than the Lewiston Gas Light Company. The three basic necessities for life are food, clothing and shelter and any business catering to these is bound of necessity to feel less effect from unusual business conditions than concerns in other and less essential lines. A large percentage of the business of modern gas companies is in the supply of fuel for domestic and industrial uses, and this field has been intensively cultivated by the Lewiston Company. A very liberal policy in the matter of rates and of prices for gas burning appliances has contributed to the prosperity of both of the cities of Lewiston and Auburn, which it serves, and to its own success.

The history of the company covers a period commencing in 1853 and its growth has been steady and consistent for the entire time, although its greatest growth has been during the last ten years. Except for a brief period during the war, yearly extensions have been made to its distribution system, until at the present time its 50 miles of mains cover practically every street in the two cities. In 10 years it has increased the number of its meters from 4,400 to 8,700 or practically a 100 per cent increase. In the same period its sales of gas have increased from 67,000,000 cu. ft. per annum to 180,000,000. This somewhat sensational growth is of the most substantial character, being very largely domestic fuel consumption, a field in which it has no real competition. As volume of business is a very important factor in the matter of rates, it is very likely that in the not distant future recessions may be possible in the rates for gas, depending, of course in some measure on return to normal of prices for oil and coal, the principal commodities used in the manufacture of gas. The extraordinary conditions imposed by the war, made necessary a substantial increase in selling rates for gas, but it is worthy of note that the Lewiston company was one of the very last in New England to petition the State Commission for authority to make this increase; that it was one of the smallest increases made in this territory; and that it was one of the first companies to reduce its rates. The present rates compare favorably with any city in New England, regardless of location, and with many companies of much larger size.

Economy in operation is a large factor in the situation, and few companies may be found in which the burden of so-called "overhead expense" is kept at so low a figure. Its plant is modern in every respect, and no obsolete or dead apparatus encumbers its works. It has a compact, well designed, splendidly located and thoroughly efficient plant. During the present Winter substantial additions will be made to the manufacturing apparatus, bringing its capacity up to 1,000,000 cu. ft. per 24 hours, and enabling it to meet the fast growing demand for its product.

The ownership of the company is vested entirely in Maine hands, and in every sense of the word it is a "home owned" company. This works for the good of the community and conversely for the prosperity of the company, as a community of interest exists which is more than likely to be absent in the case of a foreign owned corporation.

The president of the company is Hon. William B. Skelton of Lewiston, former State bank examiner and an ex-member of the Maine Public Utilities Commission and one of the most able business men in the State. The treasurer is Herbert Payson of Portland, of the firm of H. M. Payson & Co., and too well and favorably known to need further introduction.

The local administration of the company is in the hands of men of ability and character with wide experience in the business, and a record of past success that augurs well for the future.

The only outstanding indebtedness of the company is an issue of $200,000 four per cent bonds maturing in 1924. These are largely in the hands of conservative Maine banks and investors, and will not emerge from strong boxes until called for payment at maturity. Should this issue be refunded by a new issue it is safe to say that these will be eagerly sought by investors who are seeking an absolutely safe investment, free from market fluctuations in value, and paying a fair return.

To Use the Panhandle Natural Gas

The big natural gas find in the Texas Panhandle will not be wasted. The United States Zinc Company, having started to build a larger smelter in the vicinity of Amarillo, using natural gas for fuel, set an example that others are to emulate. It is now announced that the United States Smelting, Refining and Mining Company will establish a plant close by and take advantage of the cheap fuel.

The plant of the United States Zinc Company will be one of five stacks and will occupy forty acres. Plans for the others not yet available. The Panhandle Gas field is one of the largest in the world. With a large consumption of gas nearby, it is hardly likely that the gas owners will bother about piping it to Denver, as was talked of early last Spring. There is plenty of room for various manufactories, and natural gas may yet make Amarillo one of the largest cities of the Lone Star State.

Spencer Co. Building New Water Gas Equipment

The Spencer Gas Company of Spencer, Massachusetts, have awarded contract to the Gas Machinery Company of Cleveland, Ohio, for one new five-foot double superheater carburetted water gas apparatus complete with reverse steam connections, air and steam meters, fuel hoist, hopper and buggy, overhead operating floor, oil pumping equipment, pyrometer, explosion check valve and auxiliary equipment.

The Gas Company is building a complete new water gas equipment at Spencer, which will conform with the very successful water gas plants that have recently been designed by the engineering department of the Gas Company and which will also serve to take care of the increased demand for gas in the Spencer district.

Gas Rate at Winona Is Increased Five Cents

Winona, Minn.—Consumers of gas in this city will pay $1.80 per thousand cubic feet during the four months' period beginning January 1, it has been announced. The new rate represents an increase of 5 cents over the rate in effect for the past four months. The increase is due largely to an advance in the cost of coal, according to company officials.

S. E. Mulholland Reviews 1922

Fort Wayne, Indiana.—S. E. Mulholland, of this city, vice-president of the Northern Indiana Gas & Electric Company, in a review of the past year and survey of the prospects for the coming year, had this to say:

"The growth of the city and the building activity during the year 1922 has caused public utilities in Fort Wayne to expand to keep pace with the development of the city.

"The public hears nothing of this from day to day, as it does of building permits for residences, storerooms, etc., but an illustration of such work and the cost is that of the Northern Indiana Gas & Electric Company in their laying of gas mains and increasing of works and plant facilities to meet the growth of the city during the past year.

"Early in the spring it became apparent there would be a large amount of paving laid in Fort Wayne in which case new gas mains are laid on such streets to prevent cutting the pavement later on and where there are already gas mains in the streets they are either renewed or thoroughly overhauled.

"The various strikes and other conditions brought about a situation whereby it was unable to secure cast iron pipe, so that it was practically the middle of October before sufficient pipe could be secured to make extensions to new residences and new and outlying additions that were being prepared by realtors for future development.

"Contrary to previous custom of having all pipe laid and work completed by November 1, the gas company has been working continuously and it will be in the first of the year before all applications that have been promised gas service have been filled.

"The total number of feet of gas pipe laid and overhauled during 1922 was approximately 52,000 feet, equivalent to some ten miles. In addition to this there have been some 1,200 service connections put into new and old houses to supply gas to the residents. The size of the gas mains varies from four inch to ten inch.

"At the works the most notable improvements consisted of two items, one of which was the installation of larger modern wash boxes and outlet connections to the gas making machines in service at the plant.

"There is at the present time ordered and under construction, but will not be completed until next year, a modern condensing apparatus, the newest and most approved of its type. This piece of modern machinery is also to help meet further growth of the city.

"These improvements are made with the idea that the plant may at all times be equal to the demand made upon it by the growth of the city. The cost of this new plant apparatus will run close to $50,000, which, with the new gas mains laid with the service connections thereto, will entail a total expenditure for new construction during 1922 of $125,000 to $135,000, and while the company's program for 1923 is not definitely determined upon, there is the probability of an entirely new trunk main system being established to meet the expected growth of the city with possibly another gas tank or holder being erected during the year. While the expense of this has not been completely estimated, these improvements may cost as much as a half million dollars."

Wrinkle Prize Winners Announced

The Wrinkle Awards Committee of the Natural Gas Association has announced the names of the natural gas workers who have been awarded prizes for wrinkles contributed to the Association during 1922.

Checks were mailed to the prize winners by General Secretary Wm. B. Way to reach them before Christmas. The committee, composed of Chairman F. W. Stone, F. F. Schauer and M. C. Smith, said: "There were so many wrinkles of merit it was hard to decide that any one was better than another."

Each wrinkle was judged on its merit alone and the prizes awarded as follows:

First Prize—$25—Wrinkle No. 75. Improved Automatic Refilling Relief Tank for Sealing Low Pressure Regulators. Contributed by H. Swanson, the East Ohio Gas Company, Cleveland, Ohio.

Second Prize—$10—Wrinkle No. 65. Handy Method for Meter Reader to Locate Leaks. Contributed by Ralph Touhy, the Logan Natural Gas & Fuel Company, Chillicothe, Ohio.

Third Prize—$5—Wrinkle No. 41. Folding Street Barricade. Contributed by Charles DeWeese, Louisville Gas & Electric Company, Louisville, Ky.

First Prize—$25—Wrinkle No. 71. Large Envelope to Prevent Loss of Valuable Papers in Office Work. Contributed by T. H. Kerr, the Ohio Fuel Supply Co., Columbus, Ohio.

Second Prize—$10—Wrinkle No. 56. Method of Accounting for Free Gas. Contributed by Mrs. A. C. Hancock, the Ohio Fuel Supply Co., Mt. Vernon, Ohio.

Third Prize—$5—Wrinkle No. 30. Drawing Protector. Contributed by Z. C. Odenkirk, the East Ohio Gas Co., Cleveland, Ohio.

First Prize—$25—Wrinkle No. 6. Testing Well Production with a Flowmeter. Contributed by Thomas D. Cabot, Charleston, W. Va.

Second Prize—$10—Wrinkkle No. 34. Portable Swabbing and Bailing Device. Contributed by George Fonner, American Natural Gas Co., Bakerstown, Pa.

Third Prize—$5—Wrinkle No. 36. Automatic Device for Gasoline Blowing Tanks. Contributed by Harry G. Bush, the Ohio Fuel Supply Co., Homer, Ohio.

First Prize—$25—Wrinkle No. 77. Convenient and Economical Method of Packing Dresser Coupling Without Interrupting Service. Contributed by W. S. Kelly, United Fuel Gas Co., Huntington, W. Va.

Second Prize—$10—Wrinkle No. 15. Compressor Indicator Reducing Motion. Contributed by Paul Luebecker, the Manufacturers Light & Heat Co., Pittsburgh, Pa.

Third Prize—$5—Wrinkle No. 26. An Improved Manifold Valve for Orifice Meter Ranges. Contributed by T. H. Kerr, the Ohio Fuel Supply Co., Columbus, Ohio.

Pacific Gas & Elect. Co. to Cut Rates

San Francisco, Calif.—A reduction in the electric rates of the Pacific Gas & Electric Company that will result in an annual saving of approximately $2,500,000 to consumers, was announced recently by the State Railroad Commission.

The new schedule will be effective on flat rates February 1, 1923, and on meter rates February 20, 1923. An entirely new rate structure is established, reducing the present rate by 12 per cent. Both light and power users are included in the new classification.

The rates are fixed on the valuation of $109,723,695 for the company's electrical properties, which has just been arrived at by the commission. The company contended that this valuation was $170,711,271 and asked for rates equivalent to those obtained when a 15 per cent surcharge on the present rate base was in effect.